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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,657	07/11/2001	Tsuyoshi Nakamura	Q65210	7845

7590 04/16/2003

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2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/901,657

Applicant(s)

NAKAMURA ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

This is written in reference to application number 09/901657 filed on July 11, 2001 and published as US 2002/0031720 on March 14, 2002.

Information Disclosure Statement

1. The Information Disclosure Statement filed on August 30, 2001 has been entered and fully considered.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

3. Applicant's election without traverse of claims 1-12 in Paper No. 6 is acknowledged.
4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

5. Claims 3-5 are objected to because of the following informalities: the said claims fail to contain a period at the end of the sentence. Appropriate correction is required.
6. Claim 9 is objected to because of the following informalities: the claim as written contains parentheses. The said parentheses *do not* render the claim indefinite. However for improved clarity, the examiner suggests amending the claim to read, "... a molecular weight

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distribution (Mw/Mn), where Mn is a number average molecular weight, is equal to or less than 3.5." Appropriate correction is required.

7. The examiner notes that the instant claims and specification fails to contain a component (A). To prevent confusion, the examiner suggests changing the presently labeled components (B), (C) and (D) to A, B and C respectively.

8. The examiner further notes that the Brief Description of the Drawings is located on page 28 of the specification, after the Summary of the Invention. Traditionally, the brief description of the drawing is located prior to the summary of the invention. See MPEP 601.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-3 and 5-9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6517993 B1 in view of Uetani et al. (US 6495306 B2). Nakamura (US '993) claims a novel copolymer comprising a repeating unit (A) represented by formula (I); and a repeating unit (B) derived from an unsaturated carboxylic anhydride (cl. 1). Nakamura further claims that

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the copolymer of claim 1 may further comprise a repeating unit (C) represented by formula (II) (cl. 2) or a repeating unit (D) represented by formula (III) (cl. 3). Nakamura fails to claim a copolymer comprising taught components (A), (B), (C), and (D). Uetani teaches in the background section that high dry etching resistance, high resolution as well as good adhesion to a substrate can be attained when using a polymer or copolymer of 2-methyl-2-adamantyl in a resin (c. 1, l. 49-57). It is the examiner's position that 2-methyl-2-adamantyl meets the limitations of the taught formula (III). In light of the background teachings of Uetani and the fact that Nakamura teaches that both formulae (II) and (III) can be further incorporated into the polymer of claim 1, it would have been obvious to one of ordinary skill in the art to incorporate a repeating unit such as 2-methyl-2-adamantyl, into the terpolymer of claim 2 of Nakamura in order to make a polymer which when used in a resin has high dry etching resistance, high resolution as well as good adhesion to a substrate.

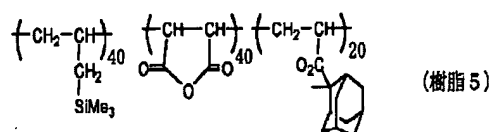
Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

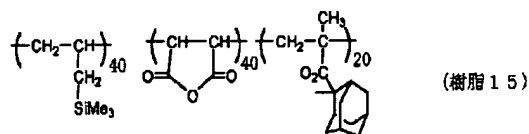
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

12. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Mizutani et al. (JP 2001-188349 A, machine translation of abstract, examples and claims).



Mizutani exemplifies a polymer 5 having the structure:

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(p. 0126) and a polymer 15 having the structure:

(p.

0127). It is the examiner's position that the first monomer of the said polymers meets the limitations of claimed component (C); the second monomer meets the limitations of claimed component (B); and the third monomer meets the limitations of claimed component (D) wherein R1 is H and methyl respectively and R2 is methyl. When R1 is methyl, as in polymer 15, the limitations of instant claim 5 are met. Mizutani also exemplifies a resist composition comprising the said polymers, triphenylsulfonium as a compound, which generates an acid and propylene glycol mono-methyl ether acetate (PGMEA) as the solvent (p. 0129-131; Table 1). Table A discloses that polymer 5 has a molecular weight of 8600 and polymer 15 has a molecular weight of 12600. The acid generators for examples 5 and 15 are 4-t-butylphenyldiphenyl sulfonium salt and 4-t-butylphenyldiphenyl nonaflate salt respectively (based on a spot translation provided by the USPTO Translation Branch), which meet the limitation of a triphenylsulfonium-based onium salt as set forth in instant claim 11. Mizutani is silent on the molecular weight distribution, however one of ordinary skill in the art would expect that the distribution would be at least 1, which meets the limitation of instant claim 9. See also claims 1-4.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

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the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster et al. (US 6,165,682 A) in view of Uetani et al. (US 6,495,306 B2). Foster exemplifies in example 3 (c. 9, l. 60-c. 10, l. 5), an imaging layer solution comprising poly(maleic anhydride-allyltrimethylsilane-t-butyl acrylate-methyl acrylate); triarylsulfonium perfluorooctansulfonate photoacid generator; and 2,4,5-triphenylimidazole dissolved in propylene glycol methyl ether acetate (PGMEA). Suitable aryl groups are taught to be substituted or unsubstituted phenyl or naphthyl groups (c. 5, l. 56-65). Foster teaches all the limitation of the instant claims except it fails to teach and/or suggest a repeating unit represented by claimed formula (III). Uetani teaches in the background section that high dry etching resistance, high resolution as well as good adhesion to a substrate can be attained when using a polymer or copolymer of 2-methyl-2-adamantyl in a resin (c. 1, l. 49-57). It is the examiner's position that 2-methyl-2-adamantyl meets the limitations of the taught formula (III). It would have been obvious to one of ordinary skill in the art, in light of the background teachings of Uetani, to incorporate a repeating unit such as 2-methyl-2-adamantyl, into the polymer of example 3 of Foster in order to make a resin which has improved dry etching resistance, high resolution as well as good adhesion to a substrate.

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al. (JP 2001-188349 A) or Mizutani et al. (JP 2001-188348 A) as applied to claims 1-3 and 6-12 above, and further in view of Coe (US 6,218,476 B1). Mizutani, as discussed above, teaches all the limitations of the instant claims except it fails to teach the use of a compound

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represented by claimed formula (XVI) as set forth in instant claim 4. Mizutani does however teach the use of maleic anhydride represented by claimed formula (V). Coe teaches that maleic anhydride and himic anhydride are examples of acid anhydrides, which may be used to introduce functionality to a polymer (c. 5, l. 1-16). Himic anhydride is structurally equivalent to claimed formula (XVI). It is the examiner's position that the teachings of Coe serves to equate maleic anhydride and himic anhydride in the polymeric art. Therefore, one of ordinary skill in the art would have been motivated by the teaching of Coe to substitute himic anhydride for the exemplified maleic anhydride of Mizutani and expect reasonably similar results.

17. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foster et al. (US 6,165,682 A) in view of Uetani et al. (US 6,495,306 B2) as applied to claims 1-3 and 5-12 above, and further in view of Coe (US 6,218,476 B1). Foster in view of Uetani, as discussed above, teaches all the limitations of the instant claims except it fails to teach the use of a compound represented by claimed formula (XVI) as set forth in instant claim 4. Foster does however teach the use of maleic anhydride as represented by claimed formula (V). Coe teaches that maleic anhydride and himic anhydride are examples of acid anhydrides, which may be used to introduce functionality to a polymer (c. 5, l. 1-16). Himic anhydride is structurally equivalent to claimed formula (XVI). It is the examiner's position that the teachings of Coe serves to equate maleic anhydride and himic anhydride in the polymeric art. Therefore, one of ordinary skill in the art would have been motivated by the teaching of Coe to substitute himic anhydride for the exemplified maleic anhydride of Foster and expect reasonably similar results.

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Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Nakamura et al. (US 20020031719 A1) which is the published application of US document 6517993 reference above.
- Hien et al. (US 6514663 B1) which exemplifies a highly sensitive photoresist layer comprising a polymer containing maleic anhydride, tert-butyl methacrylate and allytrimethylsilane (see ex. 5).

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

21. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.



Yvette Clarke Thornton
Junior Examiner
Art Unit 1752

yct
April 14, 2003